SEMESTER END EXAMINATION, DECEMBER 2024

Course Name: - B. Tech | Semester: - 1st
Paper Name: - Engineering Chemistry | Paper Code: - NBS-103
Time - 3Hrs + 20 minutes per hour extra time for V.I. & examinees with writer.
Max Marks-70

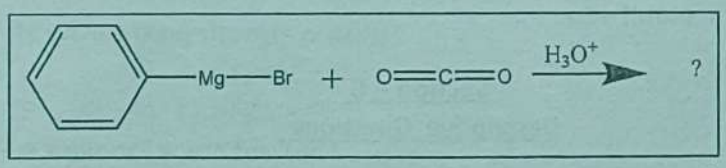
Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **03** marks. All questions are compulsory.
- Section B- Answer any **5 out of 7** given questions in maximum hundred **(150) words**. Each question carries **7 marks**.
- Section C- Answer any **2 out of 3** given questions in maximum one hundred fifty **(500) words**. Each question carries **10 marks**.
- Section D- Each question carries **02** marks. All questions are compulsory.

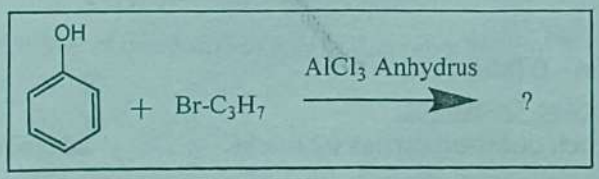
Section – A
Objective Questions

1. Answer all the following questions. **5×3=15**

1. If the reaction (Butan-2-one + $LiAlH_4$ → Buatan-2-ol) occurs in D_3O^+ then
   a) Deuterium replaces H-atom of hydroxyl group
   b) Deuterium replaces H-atom of C-H
   c) Deuterium replaces H-atom of methyl group
   d) No reaction

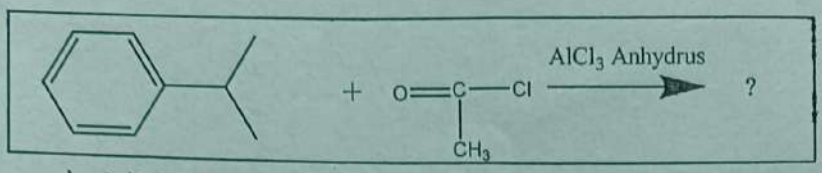
2. 

   a) Benzoic Acid
   b) Benzaldehyde
   c) Benzyl alcohol
   d) Phenol

3. 

   a) m-propylphenol
   b) Propylphenol
   c) 1-Hydroxy-2-propylbenzene
   d) p-propylphenol

Created by Lav Kush

4. 

a) 1-(2-isopropylphenyl)ethan-1-one
b) Cumenethan-1-one
c) isopropylacetophenone
d) Acetophenone

5. Electricity in terms of faraday required to obtained 13.5 gram of Al from molten Al_2O_3 will be
a) 1.2
b) 1.5
c) 2.5
d) 2.2

ater sample containing calcium ch
al hardness is
250.12
260.13
3. The p and n type of semic
a) B & C
b) Ga & Ge
4. Faster attac
a) Amide
b) Alde

Section – B
Short Answer Questions

2. Answer any five of the following questions in maximum 150 words. **5×7=35**

1. Discuss the detail Manufacturing of Cement.
2. What is a galvanic cell? Discuss the working of a galvanic cell having Cu and Zn as electrodes.
3. What is a P-n junction? On the basis of band theory classify conductors, insulators, and semiconductor with its types and examples.
4. Discuss the electrochemical theory of Corrosion and its types and affecting factors.
5. How defects causes imperfection in crystalline solids. What is F-center?
6. Explain the phase behavior of water with the help of a phase diagram.
7. Calculate the net cell potential for a galvanic cell (E^0cell Zn = -0.76 and Cu = 0.34)

$Zn \rightarrow Zn^{2+}(0.02M)// Cu^{2+}(0.003M) \rightarrow Cu$

Section – C
Descriptive Questions

3. Answer any 02 question of the following questions. **2×10=20**

1. Focusing the goals of green chemistry explain its twelve principles.
2. Explain liquid crystal and its classification with structures of *mesogens* and their examples.
3. Lubricants are the key requirement of heavy industry. Discuss acting mechanism classification and functions of a good lubricant.

Section – D (Mid-Test)
Objective Questions

4. Answer all the following questions. Each question carries **02** marks. **10×2=20**

1. The correct bond dissociation energy order is
a) $N_2^+ > N_2 > N_2^{2-}$
b) $N_2 > N_2^+ > N_2^{2-}$
c) $N_2 > N_2^{2-} > N_2^+$
d) $N_2^{2-} > N_2 > N_2^+$

Created by Lav Kush

2. A water sample containing calcium chloride and magnesium sulphate each of weight 150 gm its total hardness is

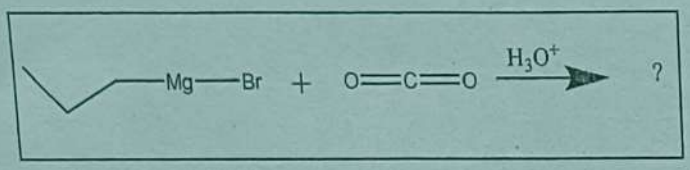
a) 250.12
b) 260.13
c) 263.12
d) 257.50

3. The p and n type of semiconductor can of Si can be obtained by respective doping of Si with

a) B & C
b) Ga & Ge
c) P & B
d) Al & As

4. Faster attack of $LiAlH_4$ will be on

a) Amide
b) Aldehyde
c) Ketone
d) Ester

5. 

a) Butanoic Acid
b) Butane
c) Butanal
d) Butan-2-One

6. Three electrolytes A, B and C connected in series containing $ZnSO_4$, $AgNO_3$ and $CuSO_4$ respectively. Current of 1.5 amperes was passed through them and 1.45g silver deposited at cathode of cell B. The time of flow of current and mass of copper and zinc deposited will be.

a) 14.10 minute, 0.3g Cu, 0.3g Zn
b) 14.00 minute, 0.3g Cu, 0.4g Zn
c) 14.40 minute, 0.4g Cu, 0.4g Zn
d) 14.50 minute, 0.2g Cu, 0.2g Zn

7. The correct bond strength order is

a) $F_2^+ > F_2 > F_2^{2+}$
b) $F_2 > F_2^+ > F_2^{2+}$
c) $F_2 > F_2^{2+} > F_2^+$,
d) $F_2^{2+} > F_2^+ > F_2$

8. In a sugar mill which fuel can be used

a) Bio fuel
b) Hydrocarbon fuel
c) Electricity
d) All of these

9. For a SN1 reaction the carbocation reactivity order is

a) $1^0 > 2^0 > 3^0$
b) $3^0 > 2^0 > 1^0$
c) $1^0 > 2^0 > 3^0$
d) $2^0 > 3^0 > 1^0$

10. Degree of freedom For $N_2(g) + 3H_2(g) \rightarrow 2NH_3(l)$

a) 0
b) 1
c) 2
d) 3

Created by Lav Kush